



# Coronavirus Disease 2019 (COVID-19)

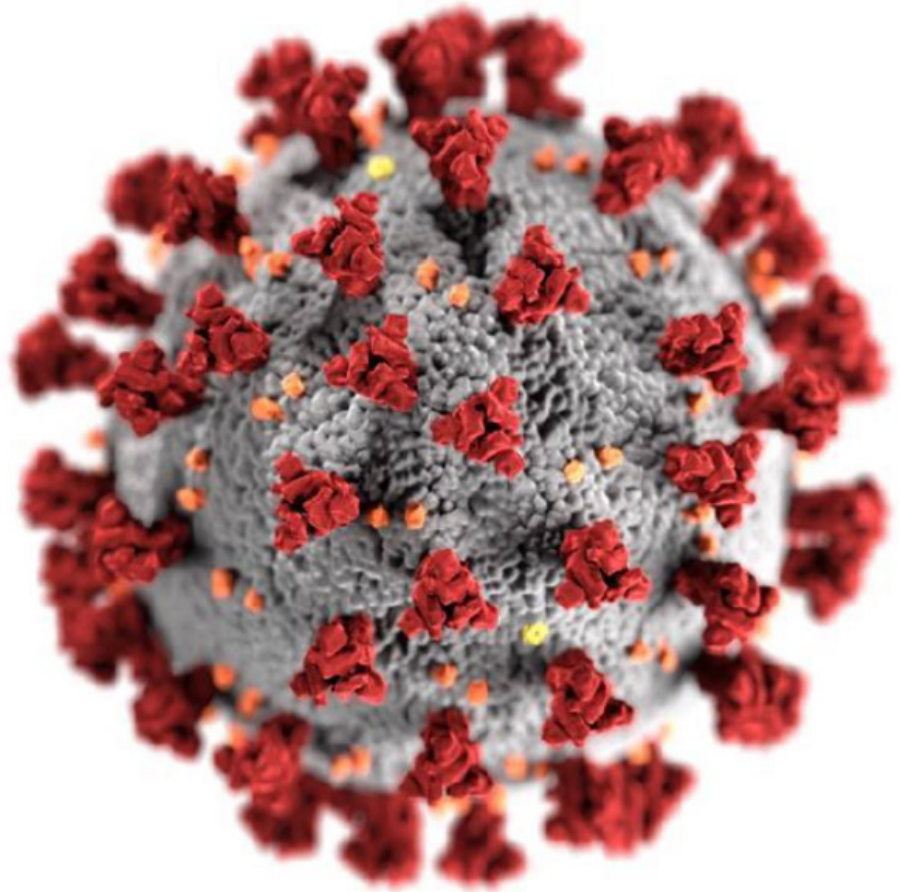
## SPHERES

SARS-CoV-2 Sequencing for Public Health Emergency Response, Epidemiology, and Surveillance

### A National Open Genomics Consortium for the COVID-19 Response

CDC is leading the **SARS-CoV-2 Sequencing for Public Health Emergency Response, Epidemiology and Surveillance (SPHERES)**, a new national genomics consortium to coordinate SARS-CoV-2 sequencing across the United States. Large-scale, rapid genomic sequencing of the virus that causes COVID-19 will allow public health experts to

- Monitor important changes in the virus as it continues to circulate.
- Gain important insights to support contact tracing.
- Provide crucial information to aid in identifying diagnostic and therapeutic targets.
- Advance public health research in the areas of transmission dynamics, host response, and evolution of the virus.



With extensive participation from US clinical and public health laboratories, academic institutions, and the private sector, the SPHERES consortium aims to generate information about the virus that will strengthen COVID-19 mitigation strategies.

### SPHERES Overview

The SPHERES consortium is being led by [CDC's Advanced Molecular Detection \(AMD\) program](#), which over the past six years has invested in federal, state, and local public health laboratories to expand the use of pathogen genomics and other advanced laboratory technologies to strengthen infectious disease surveillance and outbreak response. SPHERES aims to

- Accelerate the use of real-time pathogen sequence data and molecular epidemiology for the COVID-19 pandemic response.

- Organize and manage public health sequencing and response efforts across the United States.
- Coordinate and support sequencing at state and local public health laboratories across the country.
- Better engage US clinical, academic, and commercial laboratories that are sequencing—or planning to sequence—SARS-CoV-2 data on any scale.
- Improve communication and knowledge-sharing between US laboratories.
- Develop consensus guidance on critical data and metadata standards.
- Reduce barriers to bioinformatic analysis and data sharing.
- Better align sequencing requirements and resource needs with different sources of funding, technology, expertise, and other means of support.

The SPHERES consortium includes 37 state and local public health laboratories, several large regional and national clinical diagnostic corporations, and academic and non-profit leaders in pathogen genomics, bioinformatics, and public health from across the country. Moreover, the consortium aligns federal laboratories and public health agencies with international genomics efforts and engages the private sector in efforts to better understand the genomics and patterns of SARS-CoV-2 transmission across the United States.

## SPHERES Objectives

The SPHERES consortium has 8 core objectives:

1. To bring together a network of sequencing laboratories, bioinformatics capacity and subject matter expertise under the umbrella of a massive and coordinated public health sequencing effort.
2. To identify and prioritize capabilities and resource needs across the network and to align sources of federal, non-governmental and private sector funding and support with areas of greatest impact and need.
3. To improve coordination of genomic sequencing between institutions and jurisdictions and to enable more resilience across the network.
4. To champion concepts of openness, standards-based analysis, and rapid data sharing throughout the United States and worldwide during the COVID-19 pandemic response.
5. To accelerate data generation and sharing, including the rapid release of high-quality viral sequence data from clinical and public health laboratories into both the National Center for Biotechnology Information (NCBI) and Global Initiative on Sharing All Influenza Data (GISAID) repositories in near-real time.
6. To provide a common forum for US public, private, and academic institutions to share protocols, methods, bioinformatics tools, standards, and best practices.
7. To establish consistent data and metadata standards, including streamlined repository submission processes, sample prioritization criteria, and a framework for shared, privacy-compliant unique case identifiers.



8. To align with other national sequencing and bioinformatics networks, and to support global efforts to advance the use of standards and open data in public health.

## SPHERES is a consortium of the US public health and scientific community that includes

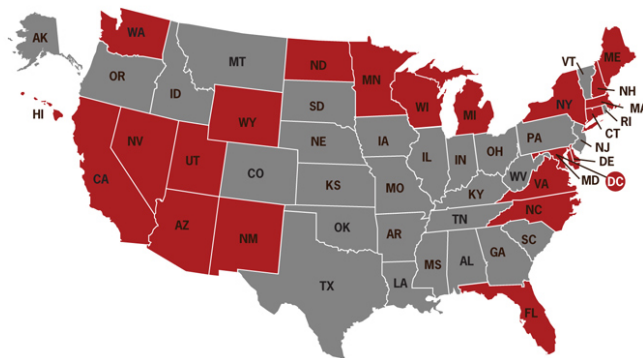
### Federal Agencies and Laboratories

Centers for Disease Control and Prevention, Office of Advanced Molecular Detection  
Argonne National Laboratory  
Defense Health Agency, Global Infectious Disease Surveillance  
Food and Drug Administration  
Lawrence Berkeley National Laboratory  
Los Alamos National Laboratory  
National Institute of Allergy and Infectious Diseases, Office of Genomics and Advanced Technology  
National Institute of Standards and Technology  
National Center for Biotechnology Information  
Walter Reed Army Institute of Research



### State and Local Public Health Laboratories

Arizona	North Carolina
California	New Mexico
Delaware	North Dakota
District of Columbia	Nevada
Florida	New York
Hawaii	Utah
Massachusetts	Virginia
Maine	Washington
Maryland	Wisconsin
Michigan	Wyoming
Minnesota	



## Academic Institutions

Baylor University  
Cornell University  
Fred Hutchinson Cancer Research Center  
Mount Sinai School of Medicine  
New York University  
Northern Arizona University  
University of Buffalo  
University of California, Berkeley  
University of California, Davis  
University of California, Irvine

University of California, Los Angeles  
University of California, San Francisco  
University of California, Santa Cruz  
University of Chicago  
University of Maryland  
University of Minnesota  
University of Nebraska  
University of New Mexico  
University of Washington  
Yale University



## Corporations

Abbott Diagnostics  
bioMérieux  
Color Genomics  
Ginkgo Bioworks  
IDbyDNA  
Illumina  
In-Q-Tel

LabCorp  
One Codex  
Oxford Nanopore Technologies  
Pacific Biosciences  
Qiagen  
Quest Diagnostics  
Verily Life Sciences



## Non-Profit Public Health and Research Laboratories

Association of Public Health Laboratories  
Bill and Melinda Gates Foundation  
Broad Institute  
Chan Zuckerberg BioHub  
J. Craig Venter Institute

Public Health Alliance for Genomic Epidemiology  
Scripps Research  
The Jackson Laboratory  
Translational Genomics Research Institute – North  
Walder Foundation



Page last reviewed: April 30, 2020

Content source: [National Center for Immunization and Respiratory Diseases \(NCIRD\), Division of Viral Diseases](#)